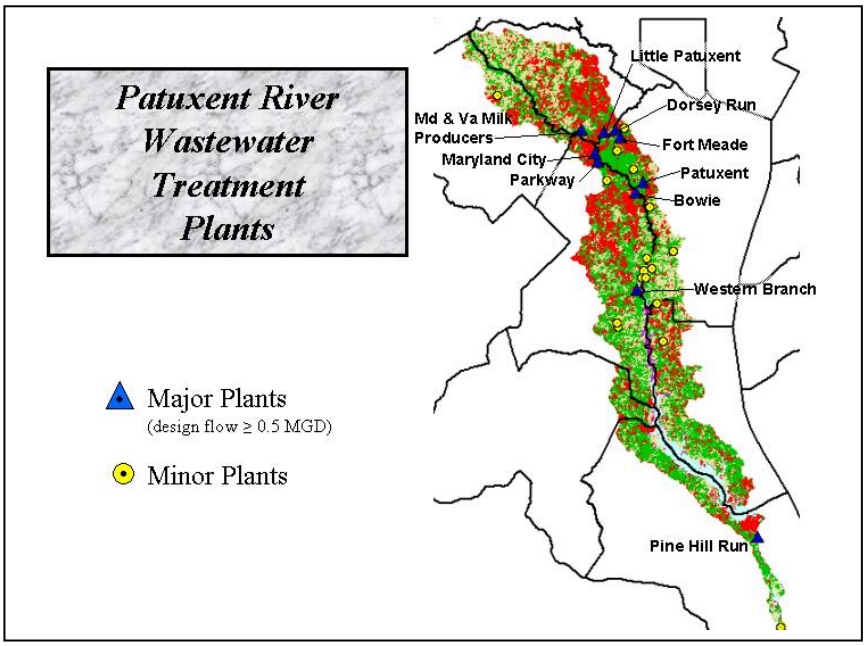
Patuxent Basin Summary

Executive Summary
1985-2003 data, January 2005

Situated between two large metropolitan areas—Baltimore and Washington—the Patuxent Basin is still mostly forested (44 percent) and agriculture (26 percent), but development pressure is increasing rapidly in many parts of the watershed. Point sources (municipal wastewater treatment plants and industrial outputs) and urban non-point runoff each contribute about a third of the nitrogen and phosphorus, while agricultural runoff contributes about a fifth. Despite improvements in nitrogen and phosphorus loadings and concentrations, phosphorus levels and water clarity are still generally poor at many locations. Algae levels and water clarity have generally worsened at long-term deepwater stations since 1985 downstream of Benedict, and poor benthic community health has been associated with these high algae levels in the lower estuary. The good news is that bay grasses have increased dramatically since 1993 in the tidal fresh and oligohaline areas, but again, the downstream mesohaline areas have not yet rebounded. Keep in mind that the lower estuary is highly affected by incoming Bay water and that improvements in the Patuxent watershed may not be as readily apparent in the lower estuary for this reason.

LOADINGS (based on watershed model)

Modeled nitrogen and phosphorus loadings have decreased somewhat since 1985. Note that some improvements were made in the Patuxent before 1985, and these improvements are not reflected in this dataset. Sediment loadings have decreased considerably.



- Total nitrogen loadings have decreased more than 15 percent from 1985 to 2002 (down to a little over four million pounds from five million). Point sources are still the dominant source contributing 34 percent of the nitrogen, but urban non-point sources are increasingly important and contribute 32 percent of the nitrogen. Agriculture plays a smaller role than in the past, now contributing only 21 percent of the nitrogen. This is due both to best management practices and land conversion.
- Total phosphorus loadings have decreased over 40 percent from 1985 to 2002 (down from 0.5 to 0.3 million pounds). Urban non-point runoff is the main contributor at 36 percent. Point sources used to contribute half, but now contribute less than a third of the phosphorus.

- Sediment loadings have declined by a third from 1985 to 2002 (down from 201,000 tons to 136,000 tons). Agricultural lands contribute much less than in the past (down to 55 percent from 75 percent) and urban non-point sources now contribute 28 percent.

LONG-TERM TIDAL WATER QUALITY (based on monitoring concentration data)

Commensurate with decreases in loadings, nitrogen and phosphorus concentrations have generally improved. Unfortunately, sediment levels have decreased in only a few areas and in fact have worsened at Jackson Landing. Algae levels and water clarity have worsened in many areas. In spite of significant improvements in phosphorus loadings and concentrations, levels remain poor in most of the tidal fresh and oligohaline stations.

- Although both total nitrogen and phosphorus levels have declined in the Patuxent River, phosphorus levels are still very high (poor condition) at many stations.
- Sediments have declined at a few stations, but have worsened at Jackson Landing.
- Algae levels and water clarity are poor and have worsened in many areas.
- Dissolved oxygen levels are poor (< 2 mg/L) Jack Bay, and only fair (> 2 mg/L but < 5 mg/L) at the lower estuary stations.

BIOLOGICAL and ECOSYSTEM MONITORING

Bay grass acres have increased dramatically in the tidal fresh and oligohaline areas, but not in the mesohaline. Benthic community health also remains in poor condition in the lower estuary (mesohaline).

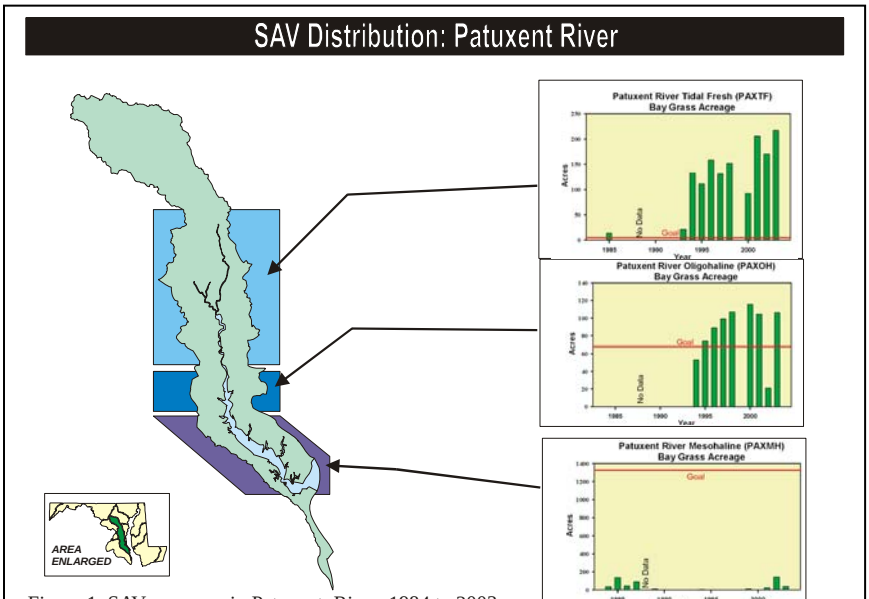


Figure 1: SAV coverage in Patuxent River, 1984 to 2003

- Bay grass beds are meeting and exceeding goals in the tidal fresh and oligohaline reaches.
- Only very small grass beds exist in the lower estuary (mesohaline), at less than ten percent of the goal.
- No recent data are available for the zooplankton community due to budget cuts.
- The Patuxent River is largely nutrient saturated in the tidal fresh areas, although some nitrogen limitation occurs in summer and fall at Nottingham, Lower Marlboro, and Above Benedict. From Below Benedict down, much of the time nitrogen is the limiting nutrient during most of the year.

For more detailed information see the complete basin summary at: http://www.dnr.state.md.us/bay/tribstrat/basin_summaries.html.